# TECHNICAL REVIEW DOCUMENT for OPERATING PERMIT 000PEP229

Valero Logistics Operations, L.P. – Colorado Springs Terminal El Paso County Facility ID: 0410548

Prepared by Long B. Nguyen January 1, 2003

#### 1. Purpose

This document will establish the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Colorado Title V Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA, during Public Comment, and for other interested parties. Information in this report is primarily from the application received on November 14, 2000, as well as numerous discussions with the applicant. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

On April 16, 1998 the Colorado Air Quality Control Commission directed the Division to implement new procedures regarding the use of short-term emission and production/throughput limits on Construction permits. These procedures are being directly implemented in all operating permits that had not started their Public Comment period as of April 16, 1998. All short term emission and production/throughput limits that appeared in the construction permits associated with this facility that are not required by a specific State or Federal standard or by the above referenced Division procedures have been deleted and all annual emission and production/throughput limits converted to a rolling 12 month total. Note that, if applicable, appropriate modeling to demonstrate compliance with the National Ambient Air Quality Standards was conducted as part of the Construction Permit processing procedures. If required by this permit, portable monitoring results and/or EPA reference test method results will be multiplied by 8760 hours for comparison to annual emission limits unless there is a specific condition in the permit restricting hours of operation.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this Operating Permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This Operating Permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this Operating Permit without applying for a revision to this permit or for an additional or revised Construction Permit.

The due date of the first semi-annual monitoring and deviation report required by this operating permit will be more than 180 days after the initial approval construction permits were issued and/or the equipment commenced operation. Therefore, under the provisions of Regulation No. 3, Section V.A.2., the Division is allowing the initial approval construction permit to continue in full force and effect and will consider the Responsible Official certification submitted with that report to serve as the demonstration required pursuant to Regulation No. 3, Part B, Section IV.H. and no final approval construction permit will be issued. The appropriate provisions of the initial approval construction permit have been directly incorporated into this operating permit.

# 2. <u>Source Description</u>

This facility is classified as a petroleum products terminal, which falls under the Standard Industrial Classification 5171. Refined petroleum products enter the facility via pipelines. The products are stored at the facility in storage tanks, and they are distributed to the market via tanker trucks. The equipment/processes at this facility include nine (9) storage tanks, a loading rack with a vapor recovery system and a vapor combustion unit, and an oil/water separator. This facility is located near Colorado Springs, El Paso County, Colorado. There are no affected states within 50 miles of the facility, and there are no Federal Class I designated areas within 100 kilometers of this facility.

The facility is subject to the regulations of CFR 40 Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart R (National Emission Standards for Gasoline Distribution Facilities, Bulk Gasoline Terminals and Pipeline Breakout Facilities). The facility has the potential to emit more than ten (10) tons/yr of any single HAP and twenty-five (25) tons/yr of any combination of HAPs. Subpart R regulations mandate that if a facility is to remain a minor source for HAP emissions, the owner must obtain a synthetic minor permit for that facility, with federally enforceable limits, by March 30, 1998. The owner failed to obtain a synthetic minor permit for HAPs by this initial deadline. Since then, the owner has obtained construction permits to limit the facility-wide HAP emissions to less than 8 tons/yr for any single HAP and 20 tons/yr for any combination of HAPs. The facility is required to have an operating permit for two reasons. First, as discussed above, the facility became a major source because the owner failed to obtain a synthetic minor permit by the March 30, 1998 deadline. Secondly, the owner modified the processes at the facility so that the facility's VOCs potential-to-emit emissions exceeded the 100 tons/yr threshold.

This facility is located in an area designated as attainment for all pollutants. Based on the information provided by the applicant, it is categorized as a minor stationary source (no single criteria pollutant emissions with a Potential-to-Emit of greater than 250 TPY) as of the issue date of this permit. The source therefore is not subject to the PSD review requirements of 40 CFR 52.21 (Colorado Regulation No. 3, Part B, Section IV.D.3). Future modifications to this facility may result in an exceedance of the major source threshold. Once that threshold is exceeded, future modifications at this facility resulting in a significant net emissions increase (see Reg 3, Part A, Section I.B.37 and 58) for any pollutant as listed in Regulation No. 3, Part A, Section I.B.58 or a modification which is major by itself may result in the application of the PSD review requirements. Facility-wide emissions are as follows:

| Pollutant       | Potential-to-Emit Emissions (tons/yr) | 1999 Actual Emissions (tons/yr) |
|-----------------|---------------------------------------|---------------------------------|
| NO <sub>X</sub> | 14.1                                  | 5.3                             |
| CO              | 35.2                                  | 13.3                            |
| VOCs            | 120.5                                 | 52.1                            |
| Single HAP      | 8.0                                   | 0.4                             |
| Combined HAPs   | 20.0                                  | 1.3                             |

Potential-to-emit emissions are permitted limits from the construction permits. Actual emissions are given by the source on APENs for the year 1999. When the construction permits were modified and issued as initial approval on May 30, 2000, there were short-term limits (quarterly) and long-term limits (annually) for both the emissions and the throughputs. The construction permits required the source to demonstrate compliance with both the short-term and long-term limits in the first twelve months of operation. The short-term limits have been omitted from the operating permit because by the time the operating permit is issued, this twelve-month period will have lapsed. The annual limitations for the emission limits and the throughput limits will be on a rolling twelve-month basis. Each month, a new

twelve-month total shall be calculated based upon the previous twelve months' data. Any exceedance of annual limitations will result in the source being out of compliance with the terms and conditions of the operating permit. The source will provide compliance monitoring reports semi-annually and compliance certification reports annually.

The vapor recovery system on the loading rack at this facility has a vapor combustion unit (VCU) that is used to achieve compliance with NESHAP, Subpart R emission limit of 10 mg TOC/liter of gasoline loaded. In addition, the VCU serves as the control device for the total VOCs emissions. Without the VCU, the pre-control VOCs emissions from the loading rack would exceed the major source threshold. The loading rack and the vapor recovery system, therefore, are subject to CAM (compliance assurance monitoring) as set forth in 40 CFR Part 64 and adopted by reference into Colorado Regulation No. 3, Part C, Section XIV. Subpart R requires the operator to install a continuous temperature sensor to monitor the temperature of the VCU. This requirement is to ensure that the VCU is getting the same or better destruction efficiency as the one that was achieved during the initial compliance stack test. A compliance test was conducted in May of 2000 and the VCU was able to meet Subpart R limit, when the temperature was maintained at 400 °F or higher. By complying with the temperature limit, the loading rack will be assured of meeting the VOCs emission limit (note: VOCs emission limit is based on the 10 mg/liter limit). The continuous temperature monitoring requirement set forth by Subpart R has been determined to be adequate for CAM purposes.

#### 3. Emission Sources

The following emission sources are specifically regulated under the terms and conditions of the operating permit for this facility:

| E001- E008, and E011 - Nine (9) Storage Tanks | E001- E008 | 3. and E011 - | - Nine (9) | Storage Tanks |
|---|------------|---------------|------------|---------------|
|---|------------|---------------|------------|---------------|

| Unit ID | Construction Permit | Description                 | Capacity (gallons) |
|---------|---------------------|-----------------------------|--------------------|
| E001    | 93EP133-1           | Internal Floating Roof Tank | 168,000            |
| E002    | 93EP133-2           | Internal Floating Roof Tank | 1,260,000          |
| E003    | 93EP133-3           | Internal Floating Roof Tank | 1,260,000          |
| E004    | 93EP133-4           | Internal Floating Roof Tank | 1,260,000          |
| E005    | 93EP133-5           | Internal Floating Roof Tank | 1,680,000          |
| E006    | 93EP133-6           | Internal Floating Roof Tank | 2,310,000          |
| E007    | 93EP133-7           | Internal Floating Roof Tank | 2,310,000          |
| E008    | 93EP133-8           | Internal Floating Roof Tank | 3,360,000          |
| E011    | 99EP0207            | Fixed Roof Tank             | 20,377             |

- a. Applicable Requirements Each of the storage tanks at this facility has its own construction permit. Consequently, each storage tank has its own throughput limit and emission limit. Storage tanks E001 through E008 are permitted to store gasoline, ethanol, and other less volatile petroleum products. Storage tank E011 is permitted to store only fuel additives. The three main regulations that are applicable to these storage tanks are 40 CFR Part 60 New Source Performance Standards NSPS, Subpart Kb (Standards of Performance for Volatile Organic Liquid Storage Vessels, Including Petroleum Storage Vessels, for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984), NESHAP (Subpart R), and Colorado Regulation 7. All of the storage tanks at this facility are subject to NSPS, Subpart Kb requirements. Subpart Kb regulations apply to storage tanks that are built after July 23, with a capacity of at least 10,568 gallons. This facility was built in 1993 and the smallest tank at the facility has a capacity of 20,377 gallons. All of the storage tanks, except for E011, are subject to NESHAP, Subpart R. Storage tank E011 is not subject to Subpart R because only fuel additives are stored in this tank; Subpart R regulations apply to only storage tanks that store gasoline. All of the tanks, except for E011, are subject to Colorado Regulation 7, Sections V and VI, Subpart B.2. Storage tank E011 is exempted from Regulation 7, Section V because this section applies to gasoline storage tanks. The capacity of storage tank E011 is 20,377 gallons. Regulation 7, Section VI Subpart B.2 is applicable to tanks that are greater than 40,000 gallons in capacity.
- **b.** Emission Factors- The VOCs emissions from the storage tanks will be calculated using EPA's Tank Model Version 4.0 or the most current version. The emission limits from the construction permits, which were incorporated into the operating permit, were calculated from Tank Version 3.1. The emissions from storage tank E001 were calculated with Tank Version 4.0 to make sure that the emissions have not changed because of a new version. After the Tank Version 4.0 was run, it was determined that the emissions from the two versions were identical. The HAPs emissions from the storage tanks will be calculated with the equation below.

HAPs (pounds) = percent x VOCs (pounds)

Percent – the percentages for the various HAPs are outlined in the table below

VOCs (pounds) – the VOCs emissions calculated by EPA TANKS Model

#### **HAPs Percentages**

| Pollutant   | Percentage |
|---|------------|
| Benzene   | 0.0109     |
| Toluene   | 0.0086     |
| Ethylbenzene  | 0.0006     |
| Xylenes   | 0.0033     |
| Methanol  | 0.0001     |
| Hexane  | 0.0181     |
| MTBE  | 0.0423     |
| HAPs percentages are from the Construction Permit Engineer's preliminary analysis, dated 1/25/00. |            |

**c. Monitoring and Compliance** – The source will track the emissions and the throughputs on a rolling twelve-month basis to determine compliance with the annual limits. Also, the source will be required to track the vapor pressure of the fluids in the tanks on a monthly basis. The twelve-month rolling average of the vapor pressure cannot exceed 5.4 psia. The source certified in the permit application that these tanks are in compliance with all of the applicable requirements.

# <u>E009 - Loading Rack with Vapor Recovery System and Gas Assisted Vapor Combustion Unit</u> (VCU)(Construction Permit 93EP133-9)

a. Applicable Requirements – This emission point is subject to NSPS, Subpart XX (Standards of Performance for Bulk Gasoline Terminals) and NESHAP, Subpart R requirements (National Emission Standards for Gasoline Distribution Facilities - Bulk Gasoline Terminals and Pipeline Breakout Stations). Subpart XX has an emission limit of 35 mg of total organic compound per liter of gasoline loaded (mg TOCs/liter) and Subpart R has an emission limit of 10 mg TOCs/liter. The operating permit has been streamlined to contain the more stringent requirement of 10 mg TOCs/liter from Subpart R.

When the construction permit was first written for this emission point, the permit engineer classified the VCU as a flare. Consequently, the applicable air pollution regulations for a flare were included in the construction permit. EPA Region VIII, however, disagreed with the engineer's interpretation. EPA believes that the VCU is a thermal oxidizer. Upon further review, the Division determined that the operating permit should be processed in accordance with EPA's interpretation. As far as Subpart R regulation is concerned, there are no additional monitoring requirements for a flare versus a thermal oxidizer. The only difference is how the source must monitor the operation of the equipment. For a thermal oxidizer, the source must install a continuous temperature sensor in the firebox. If a flare is used, the source would have to install a device that detects the presence of a flame (e.g ultraviolet beam sensor). One may interpret that the requirement to continuously monitor the temperature of the firebox is more stringent. The source has agreed with EPA's interpretation, and they have installed a continuous temperature sensor in the firebox of the VCU.

**b.** Emission Factors – The three significant pollutants emitted from this emission point are CO,  $NO_X$ , and VOCs. The CO and  $NO_X$  emissions are combustion products created by the VCU. The emission factors for CO and  $NO_X$  came from the manufacturer, and these factors are 0.085 lb CO/1000 gallons of gasoline loaded and 0.034 lb  $NO_X$ /1000 gallons of gasoline loaded. The VOCs emission, on the other hand, is a summation of two components: 1) any VOCs that have not been oxidized in the VCU and are being emitted through the stack and 2) any VOCs that are not captured by the vapor recovery system on the loading rack (i.e. the vapor recovery system is not 100% efficient in capturing the VOCs). These components are represented in the equations below. For all liquids, except for diesel and turbine fuels, the VOCs emissions will be the total of the calculated emissions from Equations 1 and 2. For diesel and turbine fuels, the VOCs emissions will be the total of the calculated emissions from Equations 1 and 3.

Equation 1 (ton) = (gallons loaded)(3.785 liter/gallon)(10 mg/liter)(2.2 lb/1000 g)(1g/1000 mg)(ton/2000 lbs)

Note: The 10 mg/liter emission factor in the equation above was derived from Subpart R emission limit.

Equation 2 (ton) = (8.69 lbs/1000 gallons loaded)(gallons loaded)(0.013)(ton/2000 lbs)

Note: **a)** The value of 0.013 in the equation above is the portion of VOCs that escape from the vapor recovery system (i.e. the system is 98.7% efficient = (1- 0.987)) **b)** the 8.69 lb VOCs/1000 gallons loaded value was derived from AP-42 loading loss (LL) equation on the following page.

LL (Ib/1000 gal) = 12.46SPM/T

Where: S = Saturation factor for submerge loading (1.0, unitless)

P = True vapor pressure of liquid loaded (5.4 psia for gasoline)

M= Molecular weight of vapors (66 lb/lb mole for gasoline)
T = Temperature of bulk liquid loaded (°F) 460 + 51 °F = 511 R

**Equation 3** = (0.035 lbs/1000 gallons loaded)(gallons loaded)(0.013)(ton/2000 lbs)

Note: **a)** The value of 0.013 in the equation above is the portion of VOCs that escape from the vapor recovery system (i.e. the system is 98.7% efficient = (1- 0.987)) **b)** the 0.035 lb VOCs/1000 gallons loaded value was derived from AP-42 loading loss (LL) equation below.

# LL (lb/1000 gal) = 12.46SPM/T

Where: S = Saturation factor for submerge loading (1.0, unitless)

P = True vapor pressure of liquid loaded (0.011 psia for jet kerosene)
M= Molecular weight of vapors (130 lb/lb mole for jet kerosene)
T = Target and the librarial loaded (0.011 psia for jet kerosene)

T = Temperature of bulk liquid loaded (°F) 460 + 51 °F = 511 R

Note: For the loading loss equation of Equation 3 above, the characteristics of jet kerosene was chosen to be representative of the characteristics for diesel and turbine fuels.

The HAPs emissions from the loading rack will be calculated with the equation below.

HAPs (pounds) = percent x VOCs (pounds)

Percent – the percentages for the various HAPs are outlined in the table below.

VOCs (pounds) – the VOCs emissions calculated by equations outlined above

#### **HAPs Percentages**

| Pollutant  | Percentage |
|--|------------|
| Benzene  | 0.0109     |
| Toluene  | 0.0086     |
| Ethylbenzene   | 0.0006     |
| Xylenes  | 0.0033     |
| Methanol   | 0.0001     |
| Hexane   | 0.0181     |
| MTBE   | 0.0423     |
| HAPs percentages are from the Construction Permit Engineer's preliminary analysis, dated 8/9/99. |            |

**c. Monitoring and Compliance** – The source will track the emissions and the throughput on a rolling twelve-month basis to demonstrate compliance with the annual limits. In addition, the source will track the temperature of the VCU's firebox, whenever there is vapor routed to the VCU, to ensure that the unit complies with the 10 mg/l limit short-term limit. In May of 2000, a compliance stack test was performed on this unit, and the results of this stack test showed that the unit complied with the limit as long as the temperature was above 400 °F (1-hour block average based on periods when vapors are routed to the VCU). If this minimum temperature is not met, the unit is deemed to be out of compliance with the 10 mg/l limit. All excess emission periods must be reported to the Division in the semi-annual excess emission reports (EERs). The source certified in the permit application that this emission point is in compliance with all of the applicable requirements.

# **E010 - Fugitive Emissions from Equipment Leaks (Construction Permit 93EP133-11)**

- **a. Applicable Requirements –** The two primary regulations that are applicable to this emission point are NESHAP, Subpart R and Colorado Regulation 7, Section V. Subpart R requires the source to implement a leak detection and repair program. Regulation 7, Section V requires sources to use RACT for any disposal of VOCs by evaporation or spillage.
- **b.** Emission Factors The emission factors in the table below will be used in determining the VOCs emissions from equipment leaks. These emission factors represent the worst-case scenario because the light liquid is the most volatile type of liquid that is processed at this facility.

| Description  | Emission Factor (kg/hr-component) |
|--|-----------------------------------|
| Pump Seals - Light Liquid  | 5.4E-04                           |
| Valve - Light Liquid   | 4.3E-05                           |
| Sample Connector - Light Liquid  | 0.015                             |
| Flanges – Light Liquid   | 8.0E-06                           |
| Drains   | 0.032                             |
| Emission factors are from "EPA Protocol for Equipment Leak Emission Estimates November 1995, EPA-453/R-95-017" |                                   |

The HAPs emissions from the equipment leak will be calculated with the equation below.

HAPs (pounds) = percent x VOCs (pounds)

Percent – the percentages for the various HAPs are outlined in the table below

VOCs (pounds) – the VOCs emissions from equipment leaks

# **HAPs Percentages**

|  | •          |
|--|------------|
| Pollutant  | Percentage |
| Benzene  | 0.045      |
| Toluene  | 0.13       |
| Ethylbenzene   | 0.0281     |
| Xylenes  | 0.1628     |
| Methanol   | 0.0004     |
| Hexane   | 0.0449     |
| MTBE   | 0.0615     |
| Cumene   | 0.0024     |
| Napthalene   | 0.0065     |
| HAPs percentages are from the Construction Permit Engineer's preliminary analysis, dated 8/9/99. |            |

**c. Monitoring and Compliance** – The source will track the emissions on a rolling twelve-month basis to demonstrate compliance with the annual limits. In addition, the source will implement the leak and detection program on a monthly basis. The source certified in their application that this emission point is in compliance with all of the applicable requirements.

# E014 - Oil/Water Separator (Construction Permit 99EP0208)

- **a. Applicable Requirements** There are no specific regulations that are applicable to this emission point. All of the requirements are from Construction Permit 99EP0208. The emissions from this unit are 4.73 tons/yr of VOCs. If this unit was located at a facility that has reportable VOCs emissions of 5 tons/yr or less (attainment area for ozone), then this unit would not be required to have a construction permit. However, the reportable VOCs emissions from this facility were above 5 tons/yr. Therefore, the unit was required to have a construction permit.
- **b. Emission Factors-** The emission factor of 5 lbs VOCs per 1000 gallons of water/oil mixture processed will be used to calculate the emissions from this source. This emission factor was derived from AP-42 (1/95), page 5.1-13, Table 5.1-2.
- **c. Monitoring and Compliance –** The source will track the VOCs emissions and the throughput on a twelve-month rolling basis to demonstrate compliance with the annual limit. The source certified in their application that this unit is in compliance with all of the applicable requirements.

# 4. <u>Insignificant Activities</u>

The following is a list of insignificant activities that was provided by the source to assist in the understanding of the facility layout.

- Eight (8) additive storage tanks, each with a capacity of 20,000 gallons
- Additive system fugitive VOCs emissions
- Additive tank truck loading VOCs emissions

#### 5. Alternative Operating Scenarios

There are no alternative operating scenarios for this facility.

# 6. Permit Shield

The following item(s) were identified by the applicant as specifically non-applicable to their facility: Colorado Regulation 7, Section IX.A.8.b.i

#### 7. Accidental Release - 112(r)

Section 112(r) of the Clean Air Act mandates a new federal focus on the prevention of chemical accidents. Sources subject to these provisions must develop and implement risk management programs that include hazard assessment, a prevention program, and an emergency response program. They must prepare and implement a Risk Management Plan (RMP) as specified in the Rule.

Based on the information provided by the applicant, this facility is (is not) subject to the provisions of the Accidental Release Prevention Program (Section 112(r) of the Federal Clean Air Act).